VIS - VIDEOTEX AND OFFICE INFORMATION SYSTEM

Technical Approach

There are several unique features of the Videotex and office Information System VIS which we feel should be pointed out:

1. The necessary software to implement a Videotex system is available from Radio Shack now.

2. The VIS software operates on proven Radio Shack hardware.

3. The total system can be supported and serviced through Radio Shack's chain of outlets and support facilities on a national scale.

4. The VIS software is developed in a highly modular form using the "C" programming language and runs under the Xenix Operating System.

5. The VIS has several combined capabilities not presently available on other systems:
   A. Keyword search (singular or multiple)
   B. Synonym matching
   C. Phonetic matching
   D. Capability to be fully menu driven
   E. Accepts spelling variations
   F. User-friendly
   G. Topical reference capability
   H. Downloading of programs and graphics
   I. Continued development and refinement

System Architecture

Version 1 of VIS is designed to be run on a single microcomputer host system. This host is a TRS-80 Model 16B using XENIX as its operating system. This method of implementation makes VIS transportable to any type of new host system that is developed in a rapidly evolving electronics field and causes only minor limitations in systems deployment for some applications.

3. Software Description

In order to present an overview of the Radio Shack Videotex and office Information System (VIS) software, it is necessary to first describe its operating environment. VIS is looked upon by Radio Shack as a long-life product and, because of this, XENIX has been chosen as the operating system, as it most allows easy portability from machine to machine and from architecture to architecture. Also, because this portability is a major issue in today's marketplace, VIS has been entirely written in the 'C' programming language. These choices allow VIS to be moved quickly to new hardware devices and architectures as they appear in the rapidly moving electronic technology market.

Now, what is VIS? It is best thought of, in its Version 1 form, as an "Electronic Filing Cabinet". This simplistic description asserts that it is easy to put data into the cabinet (system data base) and to search for, find, and read the data once it is there. Considering the additional feature that, with VIS, there are no real restrictions on terminal type for viewing the data, this becomes a simple description of an Information Storage and Delivery System as well as a Videotex System.

In Version 1, VIS is organized into two basic sections; the Data Base and the Terminal Interface. The Data Base section contains the features of a general DB system including data insert/modify/delete, data search/retrieval, data management reports, and backup/recovery. The Terminal Interface section handles user interactions, data formatting/delivery/display, and session control.

One of the basic design parameters of VIS was to make the use of VIS by both the Information Provider (IP) and the Information Consumer (User) as easy as possible. Allowing the IP to use any form of ASCII text as input gives him the flexibility to use any word processor, spread sheet calculator, or other data base system as input media for VIS. His only requirement is to mark each input of ASCII text as a "Document". The Document is the basic data entity within VIS. Its size may range from 128 bytes to 4 MB of text and may also be defined as strings of binary data for graphics and computer programs.

The VIS document, itself, controls delivery to its requestor. That is, the IP tells VIS how to deliver each document as it is inserted into the data base. This frees up the time that old style IP's required to manage "trees of pages". A major impropriety of using a "page" system is that it requires all user terminal screens to have the same "page" size. VIS, by using the concept of a document, allows the IP to produce "information units" of various sizes that will be delivered to any terminal one screen at a time, no matter what its screen size. "Control words" are used by the IP, within the documents, which allow them to set up general delivery parameters for each document, as well as its delivered price. These "control words" provide the IP with the capability to do such things as build up one document from several others, provide easy "menu" specifications, limit delivery based on terminal type, and insert pauses, screen clears, etc. VIS makes an overt attempt to NOT have arbitrary restrictions on its IP's or Users as to numbers of allowed parameters or specifications. This keeps the system relatively free of "unexpected" error events.

The (Information Consumer) User of VIS has a simple but powerful interaction capability. He may use a menu system or he may use "topical references", at his discretion. Since all users are not good spellers, VIS provides a "phonetic/alphabetic" matching capability for words input by the user. This filter

is adjustable, for "looser or tighter" matching, by each IP for his own type of data or users. By some terminologies VIS could be described as a fully inverted relational data base, which it is. An IP may have as many keywords associated with each document as he feels are warranted. Furthermore, any keyword may have as many synonyms as needed or desired. The User does not concern himself with whether his topics are document titles, keywords, or synonyms. He merely types words about the topics he wishes to retrieve and waits for one or all related documents to be returned. If the User wishes, he may query VIS as to how many documents relate to any word he types without reading the documents.

Users have powerful word combination ability with VIS. They are able to logically combine topical reference words so that a request relates to smaller or larger sets of information. The ability to AND, OR, exclusive OR (XOR) words is done with special syntax characters embedded in the user typed request line. As an example, a lawyer might query and find that there are 103 legal cases relating to murder, 98 cases relating to robbery, and 132 cases relating to rape. Since our sample lawyer is only interested in the cases which pertain to murder and robbery and rape, he is able to instruct VIS on one simple line to show him the 5 cases which are pertinent. i.e. murder/robbry/rape (note the spelling of robbery). VIS will perform all necessary operations and show him only the case documents which he wishes to see.

All text data in the VIS data base is stored in a compressed format which reduces English text words by 20% to 33%. The IP may effectively use this savings as additional disk space for information storage which he would not otherwise have. Graphics images, in binary form, are storable and deliverable by the VIS data base. Any form of graphics may be used with VIS, requiring only a pre-edit for different terminal configurations. The IP controls the type of terminal required, the style of graphics, and the size of the display in a simple manner using ASCII text characters. The User controls which documents he actually receives.

Computer programs are also deliverables of the VIS system. IP's can store source or object forms of programs, and can choose whether they are to load to memory only, as would be the case of "arcade" programs, or to be stored on remote disk for "library" programs. IP's also control to which terminal types a program can be delivered and whether they can be sent to computers of different characteristics. All in all, VIS gives the IP complete versatility in managing his own information dissemination needs, and gives the User control over his session and which information items he wishes to receive.

VIS interrogates each User terminal upon connection to the system. The response dictates the terminal's characteristics. If no response is received, VIS uses defaults which are defined at the time of adding the user to the VIS User base. A User can change these defaults at any time during a session by specifying new parameters.

The Multiplexer is an eight or sixteen port device used to buffer 300 BAUD transmissions to and from the user terminal. It contains its own CPU for message acceptance and delivery from its internal RAM buffers. These buffered transmissions are handled at a rate of 9600 BAUD back and forth to XENIX on the Host system. A VIS may use up to 4 of the sixteen port Multiplexers for a maximum system capacity of 64 ports operating simultaneously. The minimum VIS is one operational port. This very wide range of port capability allows the VIS to be configured to exactly fit a precise need for information services.

When VIS is used as a Videotex system there are some special requirements. In VIS, the System Operator of the Videotex service must be a hardware manager, generator of customer billing, data base manager, creator of special reports, and must handle system tuning and backup/recovery. In addition, the System Operator might be called on to perform technical consulting for IP's and possibly Users. He also manages the physical plant and telephone devices. The System operator may partition his total Host VIS system among up to 256 separate and distinct Information Providers. The System Operator may bill each IP at his own discretion, based on total storage used, number of ports allocated, actual usage on each port, number of users, or whatever criteria that fits his needs. VIS considers the System Operator as a profitable, value-added service provider.

Each Information Provider is given a set of VIS directories and a XENIX logon sequence. By proper creation and allocation of XENIX shells, IP's can be delimited as to the services offered to them. Each IP creates his own User base (in up to 16 separate and distinct User groups) as he sees fit, manages his own VIS documents, gets data base management reports, and in general has the services that an IP needs to make a profit from his User base(s). Each of the IP's user groups, besides being totally separate from each other, is allowed to have 16 levels of security access. This means that a security level of 3 indicates the User may retrieve documents of levels 0,1,2,&3 while he is denied from retrieving levels 4 to 16. Each document in the VIS is allowed to have a designation of both group and level specified. These levels are matched against the User's levels for proper retrieval security. The IP secures and manages only his own data base. He may not access Users or documents of other IP's.

The User may subscribe to as many IP services in a VIS as he wishes. Each IP will manage his own user records in an independent fashion. Users are allowed to log on to VIS via an ID and a password (which is not displayed when typed). He may have as many ID's as he pays for. The idea here being that each IP is a profit making one in his own right.

Inserting data into the data base can be done while VIS is also delivering data to Users, without long "lockouts" being necessary. The old VIS document is displayed up until the exact instant that the new document is successfully inserted into the data base. The System Operator works out the best arrangement for his own VIS and its data base updates. There are many VIS data base reporting functions available to System Operators and to Information Providers.

Adding new Information providers to the system is a function of the System Operator. He does this with simple ASCII text documents. Similarly, the Information Providers add new Users to the system with other ASCII text documents. The main consideration here is that every one of the three segments of operations (System Operator, Information Provider, and User) have the easiest possible (user friendly) job when interacting with VIS.

In summary, VIS is very simple to use. It maintains its functionality with the least possible work on part of the people who use it and it operates in a very straightforward manner. It is properly described as a "user-friendly" system.

Since VIS is designed to be an ongoing product, there are several areas of enhancement which can be made over a period of time. All of the enhancements will add functionality while attempting to stay within the simple confines of the original

design. User enhancements might include: Cross reference displays of indexed documents, browsing in several modes, additional operators for combining request words, Queries of billing status, and mail/message services. Information Provider enhancements might include: Added special words for use in document display capability, User statistical reporting, Current IP billing status, and controls, by User, on the VIS features available to him. System Operator enhancements might include such items as: Gateway capability to other VIS services or to other Videotex services, allocation of hard limits on data base storage usable by each IP, and finer controls on status and tuning of VIS while it is in operation.

Hardware Description

The Videotex and office Information System (VIS) couples extremely user-friendly software with state-of-the-art Radio Shack hardware to provide a cost effective Videotex system. Below are descriptions of the hardware components of the VIS.

The hub of the system is the Radio Shack TRS-80 Model 16B microcomputer. The Model 16B comes with 256K bytes of user Random Access Memory, 16K of I/O Memory and 2K of video memory. User memory is expandable in 128K increments to a total of 1.024 MBytes. It also has a small amount of "bootstrap" ROM which controls power-up and reset instructions. Once the operating system software is loaded from drive 0 (floppy disk) or Drive 4 (hard disk), this ROM is bankswitched out. Utilizing both MC68000 and Z80A microprocessors, the Model 16B accepts 16 bit data and processes it internally as 32 bit "words". Up to four 12 Mbyte hard disk drives may be added to the system for data storage. Up to five serial I/O ports can be provided as well a parallel printer port.

The Model 16B is coupled with up to four TRS-80 Communications Multiplexors to complete the "Host" Videotex system. The Communications Multiplexors are available in two versions. The 8-port version accepts eight incoming phone lines, while the 16-port version accepts 16 lines. Thus, with the present capability to support four Multiplexors, the system can service up to sixty-four users simultaneously.

Radio Shack recommends the use of TRS-80 Model 12 microcomputers for the editing and input of data to the data base. The Model 12 is a proven hardware product based on the Z80A microprocessor and, in conjunction with Radio Shack's Scripsit Word Processing software, is uniquely suited to editing text supplied by your information providers. The data may be provided as written documents, which would be keyed into the system, or communicated via phone to the Model 12 for editing.

Another component of the system would be the modems as required for communications between the Information Providers and the VIS data

The use of a serial ASCII terminal (such as Radio Shack's DT-1) attached to the Communications Multiplexor, although not required for operation of the VIS, provides the system operator with the ability to "see" the transactions between the Model 16B "host" and the Multiplexor. Also, the addition of this terminal allows the system operator to check the status of the system at any time while it is on-line.

System Installation

Upon receipt of order by the Videotex Department in Fort Worth, Radio Shack will deliver to purchaser a Software Installation Plan (SIP), which will define the schedule, pre-requisites and purchaser's resources required for installation. This SIP will also contain the events and activities that Radio Shack will follow to perform the required system installation.

Training

Upon receipt of order at the Videotex Department in Fort Worth, Radio Shack will establish, for purchaser, a schedule of training at a fee and location to be established at that time. The training will cover post-implementation system operation and development and integration of Auxiliary Application software. Training will include the use of the system statistics, registration, editing terminal types, diagnostics, operator commands and the use of the pertinent information and accounting and billing that will need to be processed. The training will not include gateway operation controls, since that feature is not inherent to the present VIS.

Maintenance

Obviously, for a system of this nature, an On-Site Maintenance Agreement should be, and is, required. This will assure minimum Down-Time, should hardware problems develop.

A. The creation of a formal trouble reporting procedure between purchaser and Radio Shack Corporate Headquarters to ensure that trouble calls are handled on a priority basis.

B. The establishment of a telephone contact for consulting between authorized purchaser's personnel and the VIS support staff in order to facilitate the distribution of new information concerning the system.

C. On-site assistance to be established through local service and support personnel.

D. Remote port access to a Host VIS system at Radio Shack's Fort Worth, Texas, headquarters, for delivery of updates and fixes.

E. All new releases or enhancements will be made available to purchaser, either at no cost or at a cost to be established by Radio Shack Corporate Headquarters at the time such enhancements become available. Corrections and bug fixes will be provided at no charge.